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~~CENTRE OF CRIMINOLOGY~~
~~JUL 20 1972~~
~~UNIVERSITY OF TORONTO~~

ANNUAL REPORT

THE CENTRE OF FORENSIC SCIENCES
DEPARTMENT OF JUSTICE
PROVINCE OF ONTARIO

1971



~~CENTRE OF CRIMINOLOGY~~

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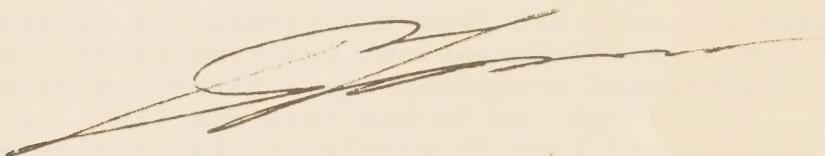
CAZON AJ 10
-A56

The Honourable D. A. Bales, Q.C.,
Minister of Justice and
Attorney General,
Parliament Buildings,
Toronto, Ontario.

Dear Sir:

I have the honour to submit the annual report regarding the activities of the Centre of Forensic Sciences for the calendar year 1971.

Respectfully submitted,



D. M. Lucas, M.Sc.,
Director.



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REPORT OF THE DIRECTOR

The Centre of Forensic Sciences came into being in 1966 with the passing of an Order-in-Council changing the name of the Attorney General's Laboratory which had been organized in 1951.

The objectives of the Centre are:

- a) To apply the principles of forensic science to assist in law enforcement and the administration of justice in the Province of Ontario.
- b) To conduct, direct and promote education programmes in forensic science for law enforcement and administration of justice officers, officers of the courts and faculties of medicine, science and law in close cooperation with the administration of the universities.
- c) To conduct and promote research programmes in forensic sciences.

The Centre is a Branch of the Public Safety Division of the Department of Justice of the Province and is totally supported financially by the Department of Justice. On April 1st, 1972 it will become a Branch of the new Ministry of the Solicitor General.

The Centre of Forensic Sciences in Toronto is the only provincial forensic laboratory in Ontario and thus provides services to the entire province. These services include pathology, toxicology, biology, chemistry, firearms and toolmarks examination, and document examination. All are provided at no cost to all official investigative bodies and to defence counsel in criminal cases in the province. In addition, some of the services are available to counsel in civil cases in those aspects of forensic science where such services are not elsewhere available. Fees are charged for services in civil cases with the fees being paid to the Provincial Treasurer.

All cases are examined by qualified forensic scientists who are available to provide testimony as to their findings and the interpretation of their findings. No charge is made for court appearances except in civil cases. The present staff complement is eighty-two, all but fifteen of whom are professionally or technically qualified in various specialties. This staff serve a population of about 7.6 million people distributed over an area of 412,582 square miles.

As can be seen from Table I, 1971 was a busy year for the Centre with an increase in case load in all sections. The overall increase was 910 cases (14.9%) and 4,093 items examined (13.7%).

The greatest increase was in the Document Examination Section (36.2%) due in part to the improvement in and expansion of the Fraudulent Cheque File. By changing this operation to a computerized handwriting classification system, we were able to offer a vastly improved service to all police forces in the province.

The increase in the Toxicology Section is significant and suggests that the restrictions in types of cases examined which were instituted in 1969 had their maximum affect in 1970. Further increases now appear likely. One other disturbing trend noted was the increase in the cases of crimes of violence received in both the Biology and Firearms Sections.

Table III shows the distribution of cases by regions, counties and districts. Although, as expected, the largest numbers of cases were received from the most populous areas, when the numbers per 10,000 of population are compared a different pattern is seen with the northern districts in particular showing the greatest use of our services. No adequate explanation of this is yet apparent.

The distribution of cases and exhibits by agency is shown in Table IV. The "other" column consists primarily of Regional Pathologists, Coroners and the Fire Marshal's Office. It also includes the forty-two civil cases received from lawyers, an increase of twelve over 1970. These returned \$4,150.00 in fees to the Provincial Treasurer.

Table V shows some of the activities of the staff other than actual case work. The decrease in the number of lectures was due to a reduction in the number of Breathalyzer courses to four from the six required in 1970 by the new legislation. The increase in miles travelled is a result of an improved method for recording this data.

In addition to the lectures noted above, twelve visitors from six forensic laboratories in foreign countries spent a total of twenty-five days in the Centre observing our techniques and procedures.

A major accomplishment in 1971 was the publication and distribution of a revised and expanded manual "Laboratory Aids for the Investigator." This project was under the direction of the Deputy Director. These manuals were provided at no cost to police forces, coroners, pathologists, fire investigators, the Ontario Police College and the Metropolitan Toronto Police College. They were also provided to lawyers on request. The Deputy Director also began the preparation of a Procedures and Policy Manual for our own staff.

In April, approval for construction of the new building for the Centre was received. Although some revisions to the plans were required by the reduction in the size of the project

and by the changes in operation which have occurred in the three to four years since the initial planning, work on the site was started in November. The target date for completion is December 1973. This building, on Grosvenor Street, will provide over 100,000 square feet of floor space and will include offices for the Supervising Coroner and morgue facilities for Metropolitan Toronto. When completed it will give Ontario one of the finest physical plants for forensic laboratory services in the world.

An agreement was finalized in 1971 between the Department of Justice and the University of Toronto for the provision of forensic pathology service to the centre by the Department of Pathology. This combining of resources should result in the provision of excellent services to the Coroners of the Province and greatly improved training in forensic pathology in the University. A world wide search for an individual to direct this service was undertaken and it is expected than an appointment will be made early in 1972.

The Director was honoured by his election as President-Elect of the American Academy of Forensic Sciences at its annual meeting in Phoenix in February. As the first Canadian to hold this position, I am naturally extremely proud and grateful to the Department and to the staff of the Centre who must share this recognition.

TABLE IA

<u>Section</u>	<u>CASES</u>			<u>Average Reporting Time</u>			
	<u>1967</u>	<u>1968</u>	<u>1969</u>		<u>1970</u>	<u>1971</u>	<u>% Change 1970/1971</u>
Pathology	212	166	73	50	61	+22.0	15.2 Days
Biology	520	535	560	587	663	+12.9	32.7
Toxicology	4928	4584	3885	3077	3341	+ 8.6	15.2
Firearms	179	266	279	350	366	+ 4.6	25.2
Chemistry	671	667	735	768	851	+10.8	24.3
Documents	754	900	1133	1247	1698	+36.2	11.6
Photography - from outside agencies	-	11	8	15	24	+60.0	22.1
other sections			(385)	(394)	(431)	+(9.4)	
Total	7264	7129	6673	6094	7004	+14.9	17.6

TABLE IB

EXHIBITS

<u>Section</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>% Change 1970/1971</u>
Pathology	224	189	145	65	70	+ 7.7
Biology	4383	4192	5059	4999	6054	+21.0
Toxicology	9208	7620	7744	6877	7113	+ 3.4
Firearms	1102	1254	1039	1361	1640	+20.5
Chemistry	3148	2829	3049	3348	3716	+11.0
Documents	6174	7036	9127	13120	15270	+16.4
Photography	-	46	28	46	46	-
Total	<u>24239</u>	<u>23166</u>	<u>26191</u>	<u>29816</u>	<u>33909</u>	<u>+13.7</u>

TABLE II

TYPE OF CASE DISTRIBUTION

Type of Case	1970	1971
Sudden Death	26.0%	25.0% of Total
Fraud	18.1	21.8
Fatal M.V.A.	11.9	11.8
Impaired Driving	7.2	7.9
Break & Entry, Robbery	7.2	5.8
Homicide & Attempted Homicide	4.8	5.2
Hit & Run	3.5	3.6
Miscellaneous Analysis and Identifications	3.1	2.5
Arson & Explosives	3.0	2.4
Clinical Toxicology	2.8	2.2
Rape	2.8	2.7
Other Sex Offences	2.5	2.2
Illegal Possession of Firearms	1.4	1.2
Assault	1.3	1.3
Miscellaneous Traffic Offences	.8	.7
Others	3.7	3.7

TABLE III

CASES COMPLETED - 1971

by

REGIONS, COUNTIES AND DISTRICTS

<u>Name</u>	<u>Population x 10,000</u>	<u>Cases</u>	<u>Cases per 10,000</u>
Metropolitan Toronto	198.1	1,757	8.9
Niagara	33.8	222	6.6
Ottawa-Carleton	44.8	194	4.3
York	15.7	149	9.5
Muskoka	2.8	64	22.8
Brant	8.7	61	7.0
Bruce	4.3	22	5.1
Dufferin	2.0	13	6.5
Elgin	6.3	74	11.7
Essex	29.4	126	4.3
Frontenac	9.1	70	7.7
Grey	6.5	126	19.4
Haldimand	3.1	11	3.5
Haliburton	.9	7	7.8
Halton	17.8	179	10.0
Hastings	9.2	143	15.5
Huron	5.0	20	4.0
Kent	9.7	36	3.7
Lambton	11.0	62	5.6
Lanark	3.9	32	8.2
Leeds and Grenville	7.2	141	19.6
Lennox and Addington	2.7	27	10.0
Middlesex	26.9	334	12.4
Norfolk	5.3	36	6.8
Northumberland and Durham	9.2	99	10.7
Ontario	18.6	144	7.7
Oxford	7.7	49	6.4
Peel	23.3	311	13.3
Perth	6.1	41	6.7
Peterborough	8.4	202	24.0
Prescott and Russell	4.2	49	11.6
Prince Edward	2.0	17	8.5
Renfrew	7.8	86	11.0
Simcoe	15.3	216	14.1
Stormont, Dundas & Glengarry	9.3	32	3.4
Victoria	3.2	37	11.5
Waterloo	24.4	216	8.9
Wellington	10.4	84	8.1
Wentworth	38.8	263	6.8
Algoma	10.5	82	7.8
Cochrane	7.9	174	22.0
Kenora	3.3	70	21.2
Manitoulin	.7	2	2.9
Nipissing	6.8	108	15.9
Parry Sound	2.4	72	30.0
Rainy River	2.2	44	20.0
Sudbury	16.9	96	5.7
Thunder Bay	13.4	101	7.5
Timiskaming	4.2	44	10.5
Average -			10.1

TABLE IV

SOURCES OF CASES

Section Pathology	Source	CASES				EXHIBITS					
		1967	1968	1969	1970	1971	1967	1968	1969	1970	1971
Metro	Metro	90	40	4	5	7	90	40	4	6	7
O.P.P.	O.P.P.	28	40	24	31	30	34	42	55	45	36
Mun. P.D.	Mun. P.D.	18	15	14	7	14	17	17	24	7	16
Others	Others	76	71	31	7	10	83	90	62	7	11
Total	Total	212	166	73	50	61	224	189	145	65	70
Biology	Metro	154	159	167	211	1360	954	1139	1228	1675	
	O.P.P.	161	164	180	206	1595	1675	2055	2047	2295	
	Mun. P.D.	197	198	191	217	1405	1510	1790	1651	2007	
	Others	8	14	22	18	23	53	75	73	77	
Total	Total	520	535	560	587	663	4383	4192	5059	4999	6054
Toxicology	Metro	248	166	165	98	133	474	314	288	266	270
	O.P.P.	1268	1201	1089	773	774	2209	2026	2092	1396	1285
	Mun. P.D.	720	721	600	482	463	1280	1256	1327	1089	965
	Others	2692	2496	2031	1724	1971	5245	4024	4037	4126	4593
Total	Total	4928	4584	3885	3077	3341	9208	7620	7744	6877	7113
Firearms	Metro	32	65	63	81	87	184	235	187	171	349
	O.P.P.	92	113	131	132	115	612	587	544	654	630
	Mun. P.D.	47	77	71	129	155	277	354	277	504	629
	Others	8	11	14	8	9	29	78	31	32	32
Total	Total	179	266	279	350	366	1102	1254	1039	1361	1640
Chemistry	Metro	120	92	90	111	99	511	381	286	454	394
	O.P.P.	242	265	326	262	309	1207	1141	1483	1244	1406
	Mun. P.D.	239	224	211	265	314	1179	1016	889	1184	1423
	Others	70	86	108	130	129	251	291	391	466	493
Total	Total	671	667	735	768	851	3148	2829	3049	3348	3716
Documents	Metro	85	88	99	111	373	1168	1311	2486	3894	3290
	O.P.P.	360	412	419	535	524	1743	1839	2090	3751	3994
	Mun. P.D.	270	325	565	535	746	2503	2680	3708	4333	7119
	Others	39	75	50	66	55	760	1206	843	1142	867
Total	Total	754	900	1133	1247	1698	6174	7036	9127	13120	15270
Photography	Metro	-	5	5	5	5	-	13	23	11	8
	O.P.P.	-	2	1	8	11	-	3	1	33	25
	Mun. P.D.	-	4	1	2	7	-	30	3	2	12
	Others	-	-	1	-	1	-	-	1	-	1
Total	Total	-	11	8	15	24	-	46	28	46	46
Total for Centre	Metro	729	615	593	578	915	3787	3248	4413	6030	5993
	O.P.P.	2151	2197	2170	1926	1969	7400	7313	8320	9170	9671
	Mun. P.D.	1491	1564	1653	1637	1927	6661	6863	8018	8770	12171
	Others	2893	2753	2257	1953	2193	6391	5742	5440	5846	6074
Total	Total	7264	7129	6673	6094	7004	24239	23166	26191	29816	33909

TABLE V

ACTIVITIES

<u>Section</u>	<u>Activity</u>	1967	1968	1969	1970	1971
Pathology	Court	43	33	36	5	7
	Days Spent	35.5	30	19	3.5	5.5
	Lectures	19	23	-	-	-
	Mileage	3600	1834	220	264	1168
Biology	Court	232	199	216	205	197
	Days Spent	239	191	199	184.5	201.5
	Lectures	92.5	80.5	15	97	61
	Mileage	45533	59093	66374	66383	58960
Toxicology	Court	148	127	172	132	145
	Days Spent	127.5	111	127.5	95.5	98.5
	Lectures	52	138	392	529	376.5
	Mileage	24890	16642	33783	17301	48534
Firearms	Court	60	65	87	109	77
	Days Spent	79.5	94	114.5	114.5	89.5
	Lectures	59	8	10	31	38
	Mileage	16071	23086	26525	31098	22163
Chemistry	Court	194	200	208	188	195
	Days Spent	160.5	183	240	226.5	204
	Lectures	137	87.5	71.5	113	77.5
	Mileage	33048	60352	56202	54573	68714
Documents	Court	115	92	107	154	177
	Days Spent	109	107.5	112.5	143	165.5
	Lectures	76	10.5	10.5	4	15
	Mileage	18984	27786	20069	17181	34468
Photography	Court	-	3	2	5	12
	Days Spent	-	2	1.5	2.5	11.5
	Lectures	-	4	2	6	21.5
	Mileage	-	3650	2762	1550	2669
Administration	Court	-	11	12	5	3
	Days Spent	-	16	14	1.5	6.5
	Lectures	-	117	89	101	97
	Mileage	-	15280	12370	10220	15920
Total Centre	Court	792	730	840	803	813
	Days Spent	751	734.5	828	781.5	782.5
	Lectures	435.5	468.5	590	881	686.5
	Mileage	142,126	207,723	218,305	198,570	252,596

REPORTS OF THE SECTIONS

PATHOLOGY

During 1971 the Pathology Section received fifty-two cases which fell into the following categories:

<u>Autopsies</u>	11
Homicides	4
Suicide	1
Drowning	1
Air Crash Victims	2
Identification Problem	1
Traffic Accidents	2
<u>Skeletal Remains</u>	16
Consultation Requests from pathologists or other sections	19
<u>Foetal Tissues</u>	2
Tissue on Weapons or 'hit & run' vehicles	4
	—
	52
	—

A directive from the Supervising Coroner to the Coroners of Ontario on October 4th, 1971 instructing them not to send any more bodies to the Centre of Forensic Sciences caused a decline in the work of the section during the last quarter of 1971.

BIOLOGY

The Biology Section deals mainly with the stains of body fluids such as blood, saliva and semen. Hairs and fibres are also identified as well as botanical materials in the form of wood-chips, plants, plant products, etc.

As in years past, the demand for the services of this section continued an upward trend with the increase in 1971 over 1970 being even more pronounced than was 1970 over 1969. During 1971 the section completed 663 cases as compared to 587 in 1970 and 560 in 1969. While an ever-increasing case load is a problem in itself, the types of cases that showed the greatest increase in 1971 - homicides and attempted homicides - present the additional problem of greater workload per case. This is shown in the 21.0% increase in the number of items examined. During 1971 the workload included 120 homicides and attempted homicides as compared with 80 in 1970.

While the overall capability of the staff continued to improve through training and research, our actual manpower was less than in 1970. Mrs. P. Newall who was on part-time basis and working three days a week on research and development, terminated her contract for personal reasons in June. Mr. W. Towstiak, a senior member of the section was off work from mid-November onward due to illness.

Research and Development

The continuing program of research and development and of training in new methods and techniques to increase the evidential value of body fluid stains resulted in a number of important advances which were introduced into case work in 1971.

1. The identification and comparison of the phospho-glucomutase enzyme polymorphs in blood stains contributed valuable evidence in the investigation of a homicide and was presented in evidence.

2. The sub-group A₂ was reported in a number of cases.

3. Further refinements of the techniques for the MN system are being made and the system is being selectively used in case work.

4. Evaluation of techniques for the identification of other enzyme systems (ADA & 6GPD) in stains is continuing.

5. Techniques for the identification of the Rh factors in blood stains are being evaluated.

6. The development of an integrated system for the identification and comparison of fibres is continuing.

7. The identification of blood group substances in hairs is being investigated as part of a long-term project aimed at improving our capabilities in the comparison of hairs as to source.

Two papers were published:

1. "The Use of Differential Scanning Calorimetry in the Identification of Synthetic Fibres," W.M.S. Philp, Journal of Forensic Sciences, 17, 132-140 (1972).
2. "Advances in the Identification of Blood Groups in Stains," S. E. Brown and P. J. Newall, Criminal Law Quarterly, 14, 66-85 (1971).

Illustrative Cases

1. A man accused of rape was exonerated by the grouping of body secretions. Grouping of the vaginal specimens from the complainant identified group "A" substance. Both the complainant and the accused were blood group "O" and therefore could not have contributed the "A" group substance. This finding suggested the involvement of a group "A" male rather than the accused. The charges were withdrawn.

2. A suspect in an armed robbery alleged that a confession of guilt was forcibly obtained by the arresting officer. Counsel for the accused submitted a shirt said to have been worn by his client at the time of the alleged beating. Examination revealed the pattern of blood staining on the front of the shirt to be inconsistent with the statement of the accused that the staining had resulted from blood having fallen from his mouth onto the shirt while he was wearing it. The staining consisted of four stains of a blood/saliva mixture of the same group as the accused on the outer surface of the chest area of the shirt. The two stains on the right were less intense than those on the left and were approximate mirror images of them (Fig. 1.). They were therefore consistent with a transfer by folding while the stains were still wet. To fold the shirt while buttoned decreased the chest measurement of the shirt by approximately four and one-half inches which would be very difficult while being worn. The accused was convicted.

3. Foul play was suspected when an adult male was reported missing. About two months later his body was found, wrapped in a sheet of plastic buried in the back yard of a friend of his wife. A partial roll of plastic similar to that on the body was found in the wife's home. The friend was charged and

ultimately convicted of non-capital murder. An important link in the chain of evidence was the matching of the irregularities on the cut edge of the plastic with irregularities on the edge of the plastic in which the body was wrapped. Fig. 2 shows one of the five areas of detailed matching.

4. A car collided with a parked car. When the police arrived both occupants of the moving car were outside, each claiming he was not the driver. Pieces of broken windshield with hairs adhering from in front of the driver's seat and from in front of the passenger's seat were submitted as well as hair samples from both parties. Comparison of the hairs from the fragments of windshield with those from the suspects revealed that the hair in front of the driver's seat could have come from one of the suspects but not from the other and vice versa. Confronted with these findings, the suspect whose hair matched the hairs in front of the driver's seat admitted being the driver.

5. The attendants at a car wash were robbed shortly before midnight one night. Police were immediately called and a description of the robber was given. A short time later a person answering the description of the suspect was seen. During his apprehension a shot was fired by a police officer which resulted in the death of the suspect. The officer stated that when the suspect was confronted he had a sawed-off rifle in his hand. He further stated that he told the suspect twice to drop the gun and on the second warning the suspect raised the gun and pointed it at him. The officer fired and the sawed-off rifle flew from the hands of the suspect.

The sawed-off weapon (a .22 calibre rifle) and some fragments of material found embedded in the left thumb of the deceased were forwarded to the Centre. Examination revealed a groove in the wood of the front of the stock of the rifle with fragments broken away. The stock was black walnut. The fragments of material which had been removed from the thumb of the deceased were chips of black walnut. These findings supported the story of the weapon being pointed at the officer when he fired. The conclusion was that the bullet from the officer's gun hit the sawed-off rifle and ricochetted hitting the suspect.

6. A construction worker fell from an apartment building under construction and died. Shortly after, the construction safety officers and the police found a part of a safety belt hooked over the edge of the 10th floor. This belt had a buckle on one end and the other end was severed; however, the portion of the belt that should have been attached to the buckle if the belt was being worn was missing. Three days later a construction safety inspector found a piece of safety belt on the 6th floor. Both pieces of the belt were brought to the Centre and it was established that -

- a) both pieces were from the same belt,

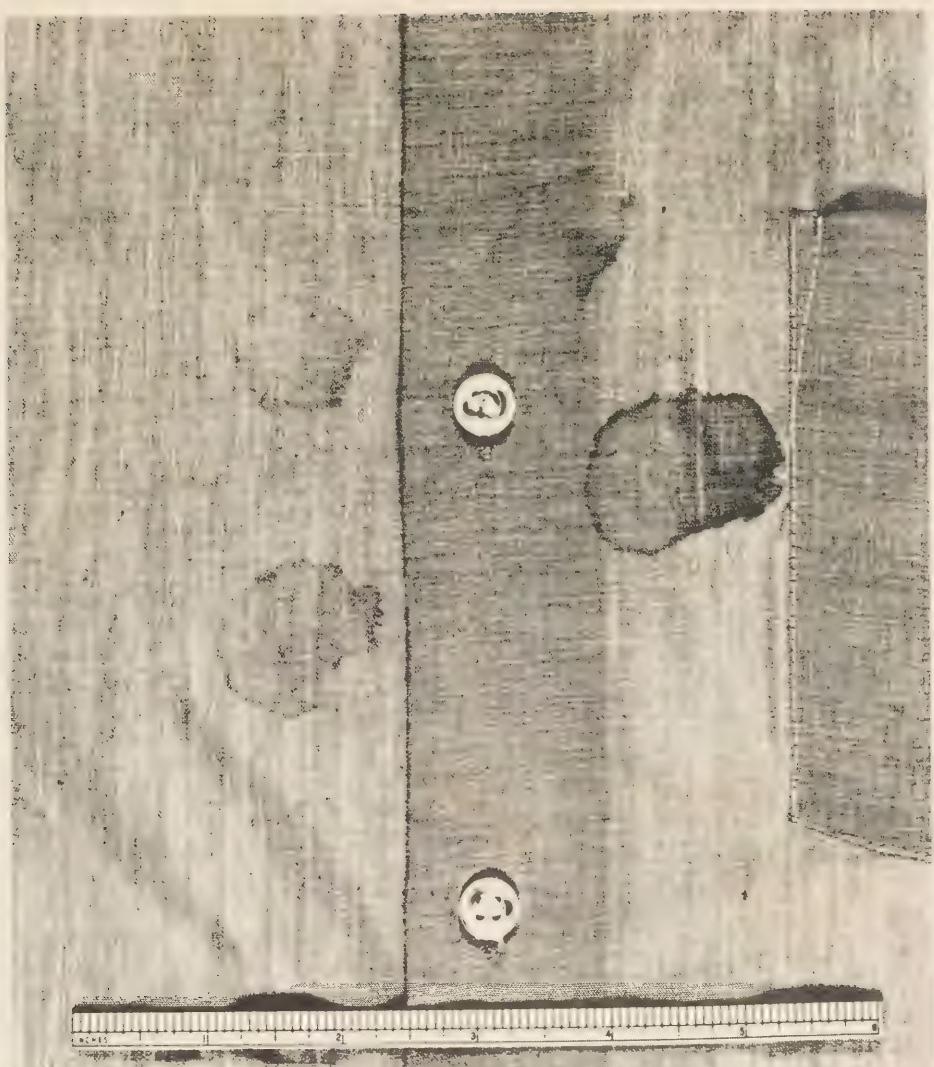
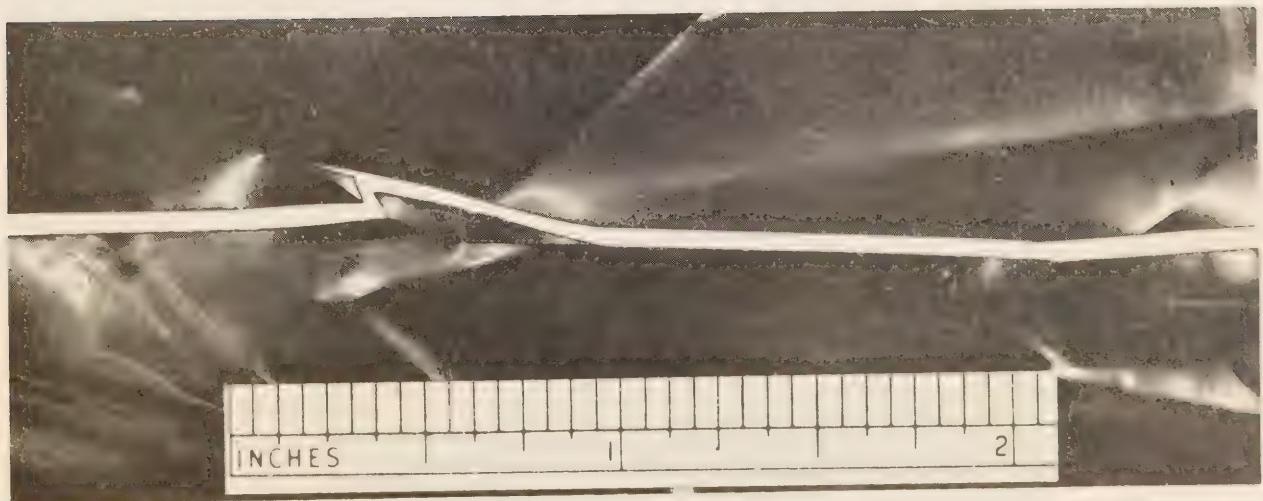


Fig. 1

Fig. 2



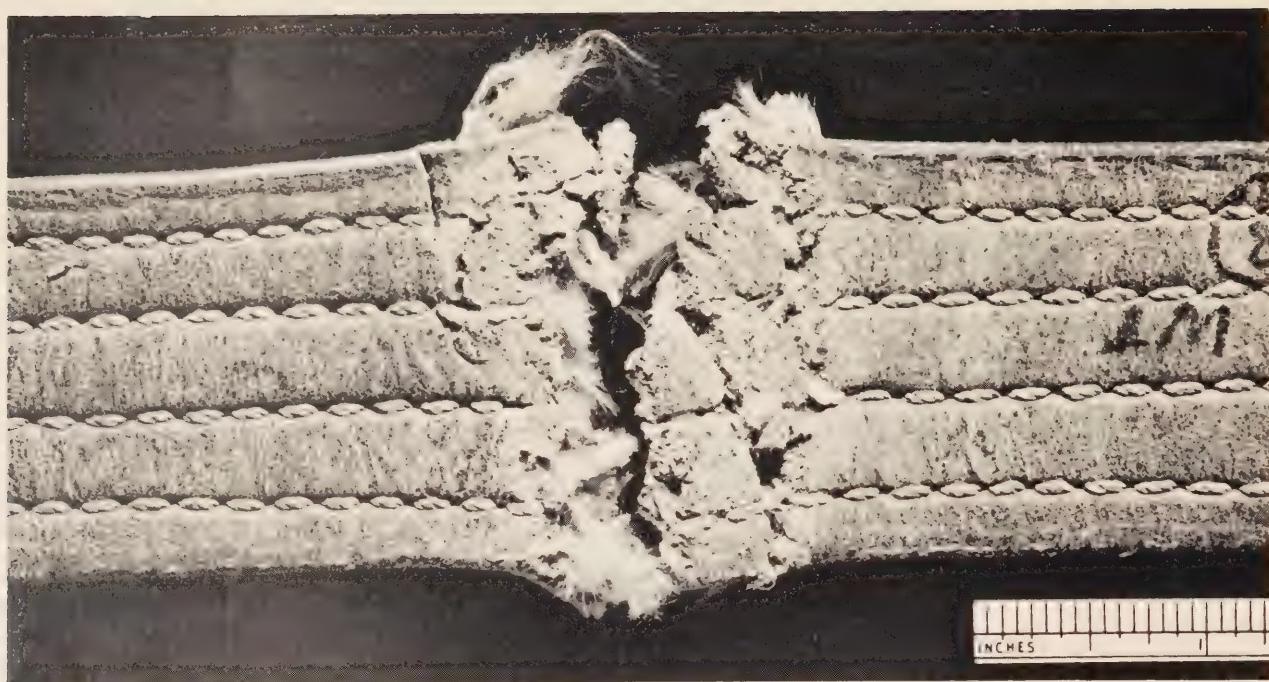


Fig. 3

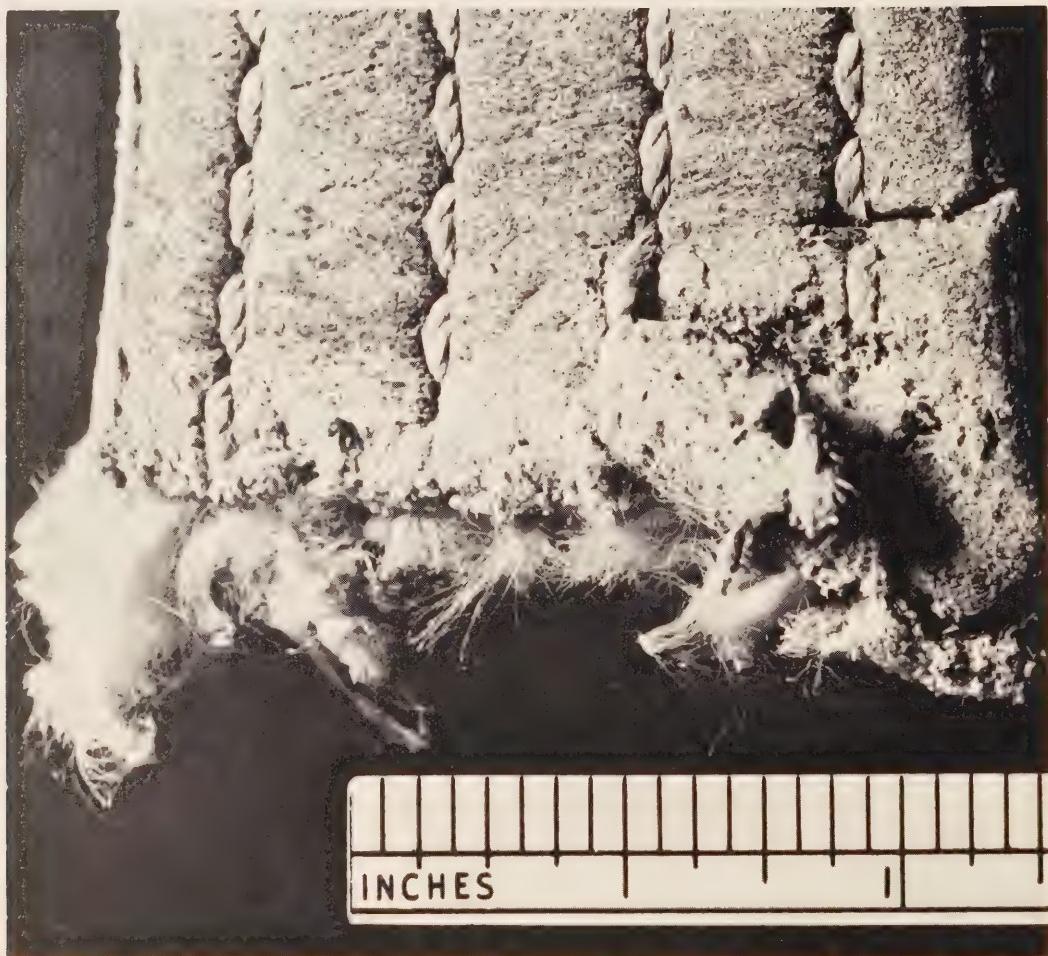


Fig. 4

- b) the belt had been severed by several cuts with a narrow sharp object such as a chisel and by a hammering action with the belt held against a corner of some hard object (Figs. 3 & 4).

As a result of this evidence, the inquest concluded that "the victim was not wearing a safety belt when he fell and that the cut belt was attached later in a bungled attempt to mislead the investigators."

CHEMISTRY

This section is responsible for all chemical analyses except those carried out in the Toxicology Section. Procedures other than chemical are used in the examination of some materials: soils are examined by mineralogical methods; mechanical parts are examined using metallurgical and mechanical testing methods; and tires and automobile lights are examined. In addition to those trained in chemistry, the staff includes a geologist and engineers who are qualified to perform the non-chemical testing.

Eighty-three more cases were handled in the section in 1971 than in the previous year. This represents an increase of almost 11% and was associated with an 11% increase in the number of items examined. There was also an increase in the number of court appearances and miles travelled.

Mr. William J. Graves is a new addition to the staff. He graduated in honours geology from Queen's University in Kingston in 1970 and after a stint of field work in northern Manitoba with a mining firm, he accepted the position of geologist in the Centre. His specialization being the use of the mineralogical microscope, he will be responsible for the analysis of soils and minerals.

The mechanical and metallurgical testing facilities were used in 32 cases during the first full year of service. These cases involved the mechanical testing of steering and braking systems, the tensile testing of wires and fabrics, determining the speed of automobiles from skid marks, mechanical and metallurgical testing of materials from industrial accidents and testing of electrical circuits. In addition to the accident cases requiring mechanical testing, 31 cases involving the examination of tires were received.

Research and Development

Very little time has been allotted to the development of better analytical procedures due to the increased pressure of case and court work.

It has been known for some time that the make of many cars can be determined from their original paint priming systems. Paint chips have been removed from damaged imported and domestic cars temporarily stored in the police pounds. The paint chips have been systematically catalogued and classified. Slides of the paint chips have been prepared with the primers displayed. These slides provide a rapid means for the microscopic comparison of paint chips found on the clothing or property of hit and run victims with a wide range of identified controls.

Fig. 5

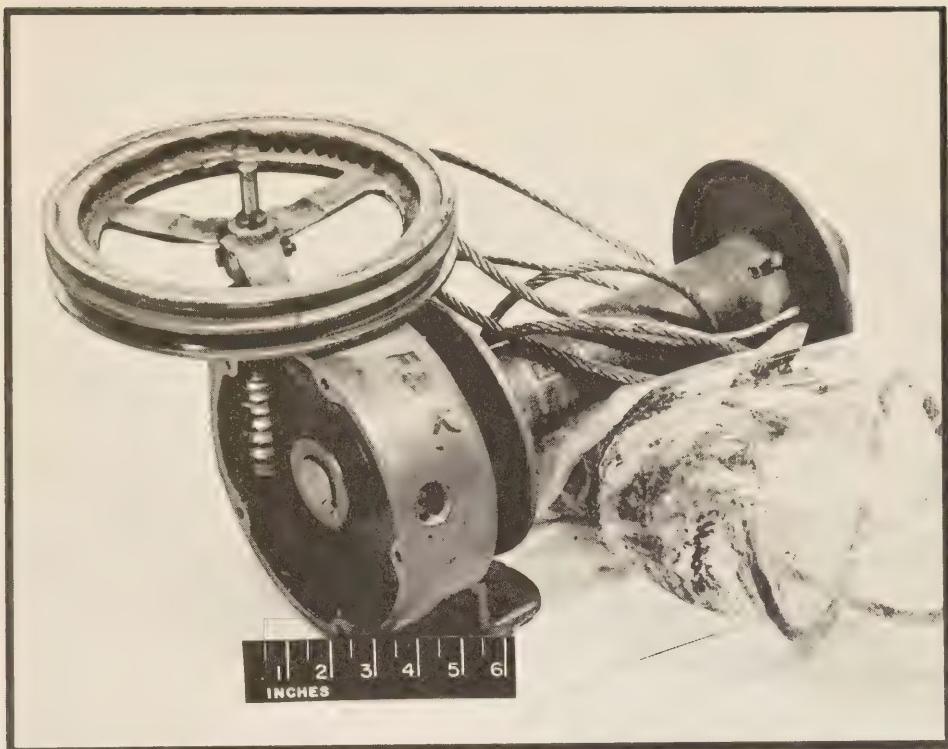


Fig. 6

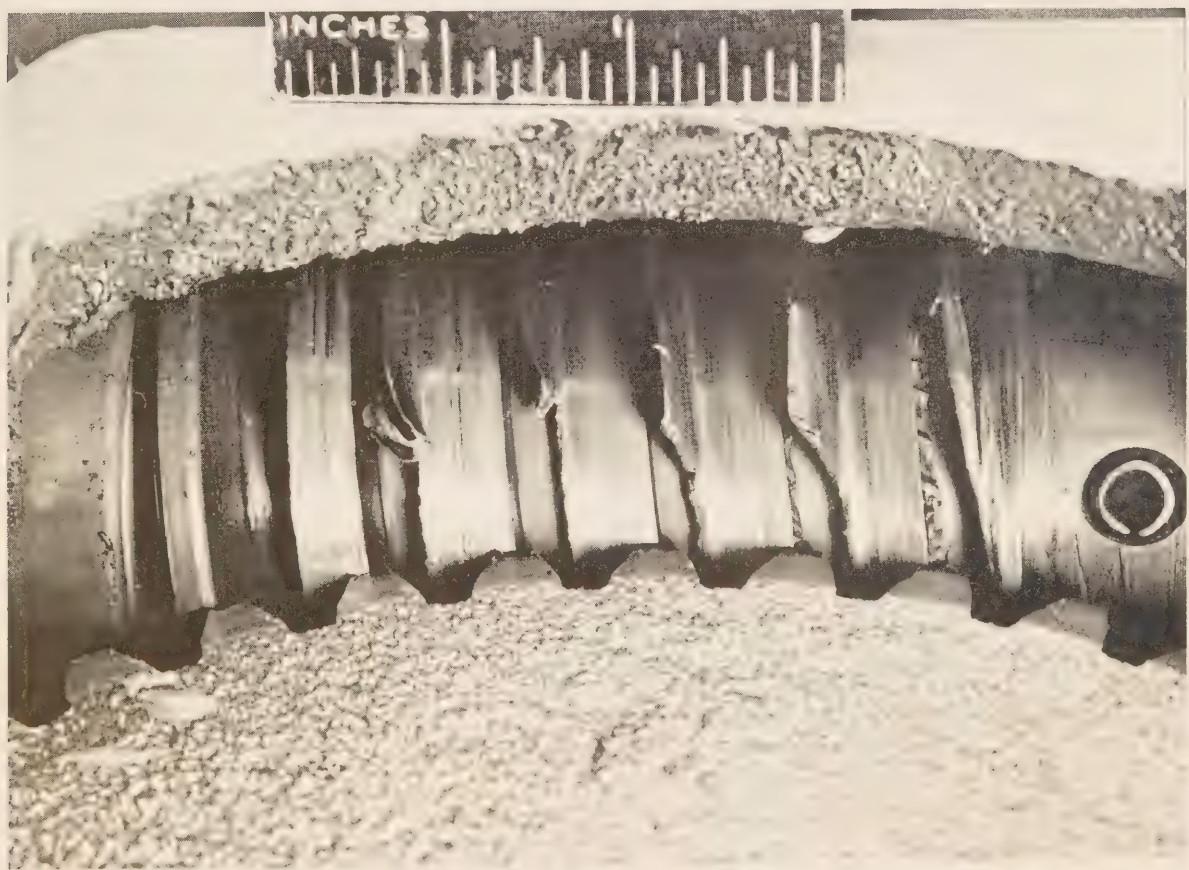




Fig. 7

A number of explosives have been prepared and analyzed. The materials and the analytical data are retained as standards for comparison with cases involving explosives. Samples of "marsh gas" have been collected from a number of sanitary landfill sites. Analysis has shown methane to be the only hydrocarbon gas present. This will allow ready discrimination between natural gas and "marsh gas" in explosion cases.

Two papers were published during 1971:

1. "Identification of Single-Stranded Copper Wires by Nondestructive Neutron Activation Analysis," R. Chan, Journal of Forensic Sciences, 17, 93-96, (1972).
2. "Rapid Detection of Firearm Discharge Residues by Atomic Absorption and Neutron Activation Analysis," S. S. Krishnan, K. A. Gillespie and E. J. Anderson. Journal of Forensic Sciences, 16, 144-151, (1971).

Illustrative Cases

1. A torque valve which controlled the power steering on a heavy truck failed in service resulting in a crash which caused the death of the driver. The pin used to prevent rotation of the cap of the valve relative to the piston rod appeared to have been broken for a considerable time prior to the accident, permitting rotation of the cap relative to the piston rod. This rotation coupled with corrosion had reduced the depth of thread engagement (or thread overlap) to such a small value that a relatively moderate jolt to the steering linkage caused the threaded parts to separate without causing additional damage to the threads.

2. Fig. 5 shows a farm silo hoist and cable which failed in service in a homemade elevator resulting in a fatality. The teeth of the worm had been worn from an original thickness of $1/8"$ down to approximately $1/50"$. Over approximately half the circumference of the worm, the remnants of the teeth had been sheared away (Fig. 6). A large quantity of metal shavings and worm tooth fragments was recovered from the gear box and was found to be identical in composition with tooth fragments removed from the worm gear. This indicated that the failure was due to wear and not foul play.

While at first glance the hoist did not appear to be overloaded (it was rated to carry 2000 lb. maximum and actually carried 720 lb. at the time of the accident), engineering calculations on the worm tooth strength indicated that the critical load for wear on the worm teeth had been substantially exceeded. The hoist was driven at 975 rpm instead of the maximum 200 rpm specified by the manufacturer. With a 720 lb. load, the hoist developed an output of .32 horsepower, almost double the .18 horsepower that would result from the manufacturer's specified maxima of 2000 lb. at 200 rpm.

Thus, failure was attributable to rapid erosion of the worm teeth caused by driving the hoist at a speed at which it delivered power substantially in excess of its maximum rating.

3. The body of a young woman was found murdered in a remote area of an eastern Ontario city. A suspect was detained and staff of the Biology and Chemistry Sections were asked to examine a truck belonging to the suspect and the scene where the body was found. Although the inside of the cab of the truck had been washed out, small amounts of blood were found on the ceiling. Many small chips of red paint were found on a rock at the scene. One of these was physically matched with an area where paint was missing from the truck (Fig. 7).

The suspect was convicted of non-capital murder.

DOCUMENT EXAMINATION

The main function of this section is to determine whether or not any piece of writing was written by a suspected person. Sometimes the questioned document is typewritten and the examiner determines whether or not a particular typewriter was used to type it. Sometimes documents are altered, erased or charred and the examiner attempts to decipher them. The usual types of cases handled by this section involve fraud, forgery, anonymous and threatening letters, suicide notes and gambling records. A related operation involves the investigation of whether or not a passer of a cheque has defrauded any other victim in the past under any other name. This is done by the classification of handwriting and other characteristics of cheques in the Fraudulent Cheque File.

1,698 cases were examined including 24 civil cases and a few cases in which documents were examined for defence counsel. In one case the section acted as a referee between two examiners in another province. The figure above represents an increase of 451 or 36% over the 1,247 cases examined in 1970. Fraudulent Cheque File cases increased rather more than other cases. They accounted for 1,010 of the above.

The increase in Fraudulent Cheque File work resulted from all police departments being made aware that our Handwriting Classification System was in operation. The system was drawn up by Mr. Schroeder in 1969. A computer program for its operation was written in 1970 by Mr. C. de Vries, a student of Computer Science at the University of Waterloo. This was "de-bugged" by Mr. Robert Fletcher, Systems Support Officer of the Department of Justice with the assistance of Mr. de Vries during the latter's term of employment with the Centre from January to April 1971.

The present operation of the Fraudulent Cheque File involves the classification of the writing on known and unknown cheques according to the Handwriting Classification System. These classifications are fed into the computer operated by the Departments of Justice and Transport and located in the Ferguson Block. A fraudulent cheque is processed by classification and by searching the computer for the cheques which match its classification most closely. Final examination is then done by the document examiners. As of 31st December 1971, classification data on 1,325 cheques were stored in the computer.

Two clerks were appointed during the year to perform the classifications required - Mrs. M. J. Roe and Mrs. L. A. Macdonald. In August, Mr. A. Bartha, who had assisted in the formation and operation of the Fraudulent Cheque File since 1961, retired having attained the age of 65. Mr. Bartha had made an outstanding contribution to the field of document examination in the development of a method for the deciphering of charred documents.

Research and Development

One paper was published in 1971:

"Checlass - A Classification System for Fraudulent Cheques" E. H. W. Schroeder, Journal of Forensic Sciences, 16, 162-175 (1971).

Illustrative Cases

1. Three men with ten years of criminal activity behind them conspired to forge and utter cheques to the value of about \$100,000. during a period of about six months. They stole blank cheques from the government of the municipality in which they resided and also stole cheques from the mail and from business offices including lawyers' offices. Using information from the stolen cheques and also using stolen chequewriters they forged and uttered cheques at banks, stores and the post office and for the purchase of used automobiles by private sale. In the latter incidents, the serial numbers and the colours of the cars were changed and the vehicles taken to Western Canada where they were sold by other known criminals.

The evidence on the handwriting, typewriting and chequewriting was strong, but one of the most incriminating pieces of evidence was found in the rubber stamp "Certified" impressions on some of the cheques.

Rubber stamps and portions of rubber stamps had been found in the possession of one of the accused. Examination of these showed that the central portion of genuine stamps had been cut out rather crudely and portions from the accused's collection had been glued into position. The impressions resulting from the crude alternations could be readily identified.

2. The leader of a well known gang of forgers was finally rendered inactive for 6½ years in 1971. For three years he had conspired with thirty other persons to pass about 250 cheques, some of which were stolen from companies and the endorsements forged, and others stolen from the mail of private individuals and their signatures forged. Arrested early in 1969, he fled to Winnipeg while on bail and continued his operations there. The police were aware of this and he was aware that his handwriting was well known to them. He therefore stopped writing cheques and instead accompanied passers to banks as backup man. When arrested again outside a bank early in 1970, he had four forged cheques drawn on a particular company in his possession. Two days later another man was arrested and he had in his possession two cheques drawn on the same company. Although the arrested persons apparently did not know each other at the time they were nevertheless charged with conspiracy. The second accused pleaded guilty during the trial after he was shown the testimony the document examiner would present, and the first accused was found guilty of 95 charges of forgery, uttering forged documents and possession of instruments of forgery.

The chief evidence showing conspiracy between the two accused was that of the document examiner who testified that the cheques in each accused's possession were not written by either of them but were written by a third person. This person continued to operate after both accused were in custody, and was not found. The document examiner spent several months on this case, receiving 1,819 documents on 65 occasions and issuing 22 reports spanning a period of a year and a half. He testified not only in Toronto but also in Winnipeg on the offences committed there.

3. A man entered into conversation with two women in a doctor's office. He told them he was going to Europe in the summer and was looking for someone to take over his car till he got back. He was willing to give one of them part ownership of the car for \$120.00. He declined to accept a cheque, so one of the women cashed the cheque she had prepared and gave him the money. He readily made out a receipt in a notebook she gave him. When the woman went to collect the car as directed, she found that there was no car. She then looked for the receipt but could not find it. However, she did produce the next page of the notebook on which the receipt was written and this page bore indentations. These were enhanced by photographic means (Fig. 8).

There is nothing unusual in a document examiner deciphering indentations but it is unusual to be able to compare the indented writing with samples of a suspect's writing and to make a positive identification. This was done in this case and the testimony of the examiner played an important part in the conviction of the accused.

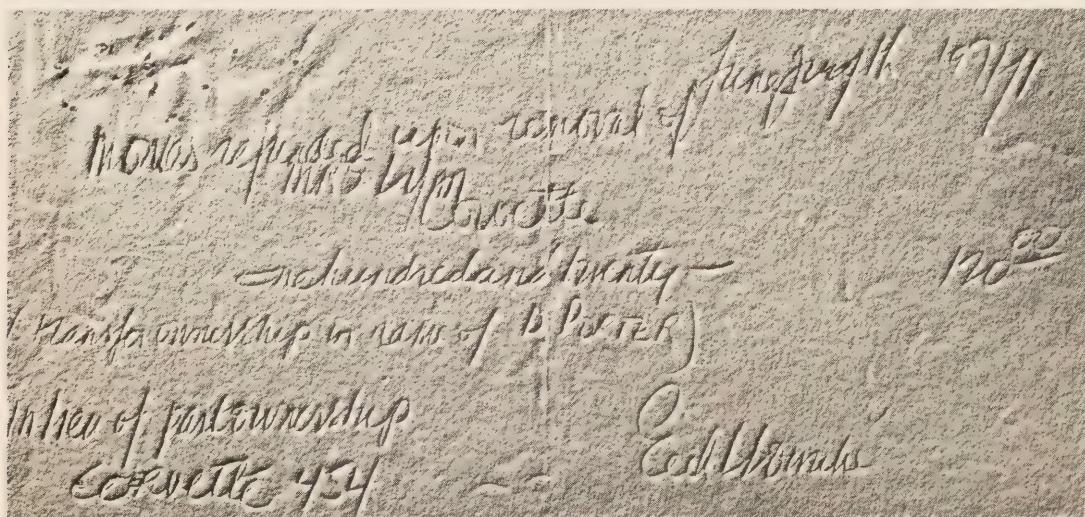


Fig. 8

FIREARMS AND TOOLMARKS EXAMINATION

The Firearms and Toolmarks Section conducts microscopic examinations of fired bullets and cartridge cases to identify the firearms from which they came. Clothing and tissue are examined for firearms discharge residues to determine the muzzle-to-target distance. The section also restores obliterated serial numbers and property marks on firearms. Toolmark examinations are also performed by this section.

Although there was an increase of only sixteen cases during the year from 350 to 366 there was an increase of 279 exhibits, from 1,361 examined during 1970 to 1,640 examined during 1971. This somewhat disproportionate increase was a result of an increase in the major types of offences. For example, attempted murders rose from 19 cases and 100 exhibits in 1970 to 30 cases and 243 exhibits in 1971, and armed robberies increased from 17 cases and 54 exhibits in 1970 to 24 cases and 153 exhibits in 1971. These two types of occurrences accounted for approximately 80% of the increase in the exhibits examined.

The staff complement remained the same in 1971 with one trainee, Mr. McKellar, resigning and being replaced midway through the year by Mr. Earl Hall, a graduate of the University of Guelph.

Research and Development

An appraisal was made of the Hycon Periphery Camera with respect to its application to the identification of fired bullets. Although some potential was found in its suitability as a screening aid, it was not felt to be of sufficient value for purchase at this time.

A project was begun to evaluate the effectiveness of the .38 special cartridge for various usages. This project will be completed during 1972.

Two agents from the North Carolina Bureau of Investigation visited the section for one week as part of their training program.

Illustrative Cases

1. On Sunday, July 4th, 1971 police were called to investigate a shooting in Northern Ontario. A man had shot and killed his wife in a motel room. Before turning himself in, he managed to dispose of the weapon. Examination of the bullet retrieved from the bed clothing under the victim indicated that it had been fired from a .32 calibre firearm, rifled 6 grooves, righthand twist. The rifling specifications were the same as the Winchester Model 94, .32 special rifle. The cartridge case found at the scene was designed for use in a lever-action type rifle. Winchester and Marlin were the principal American companies to use this type of .32 special ammunition.

Fig. 9

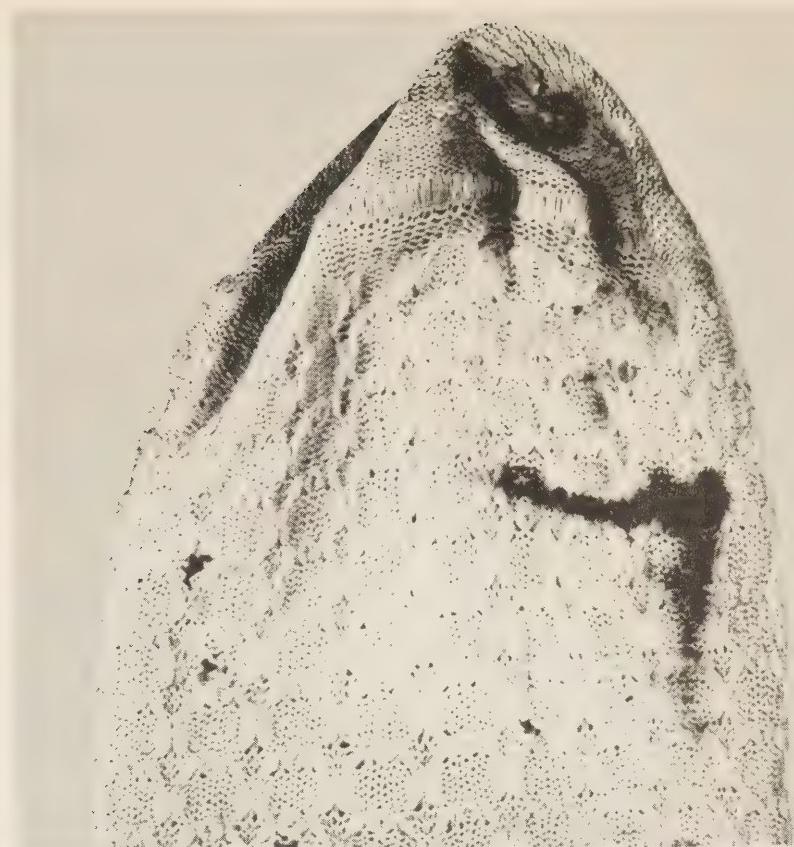
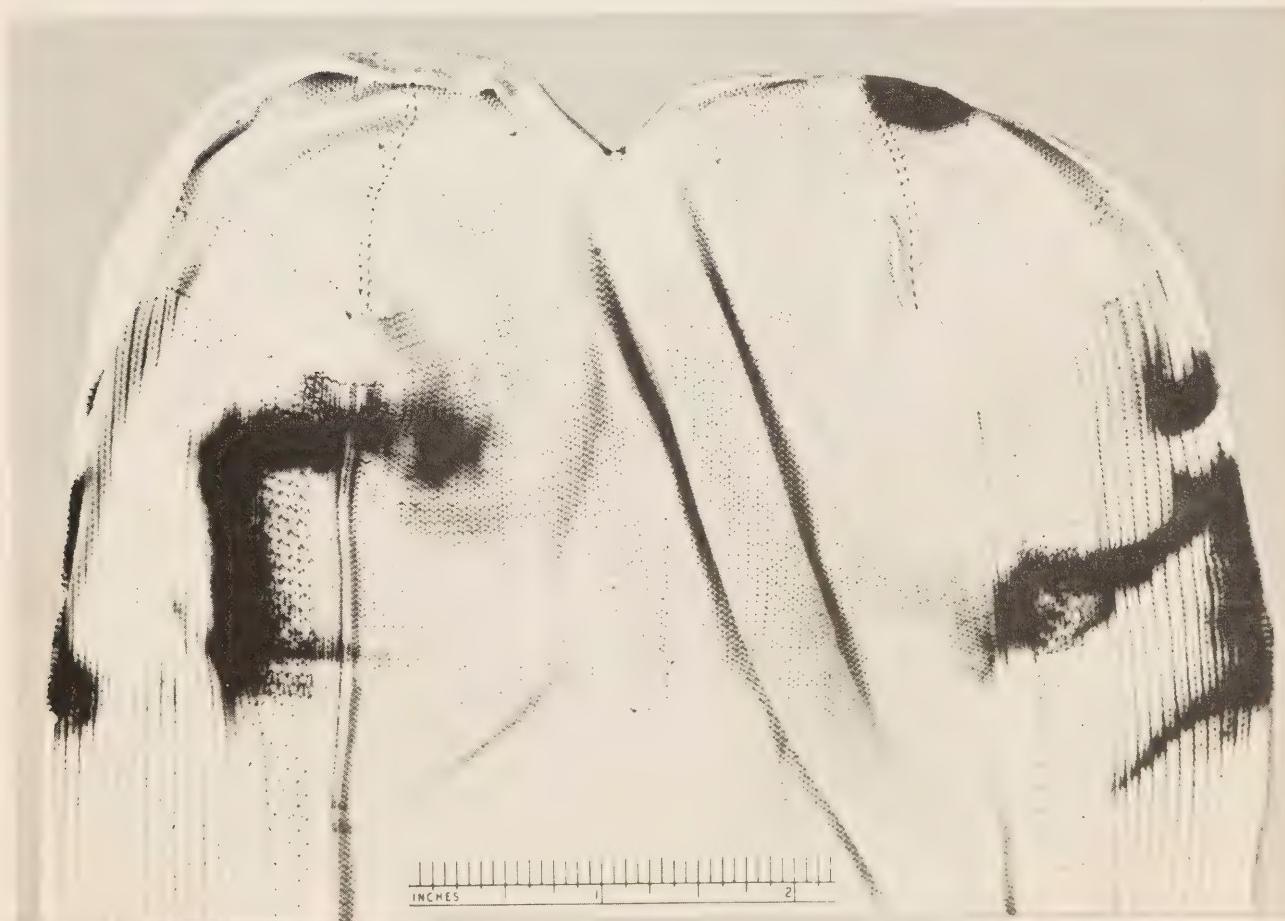


Fig. 10



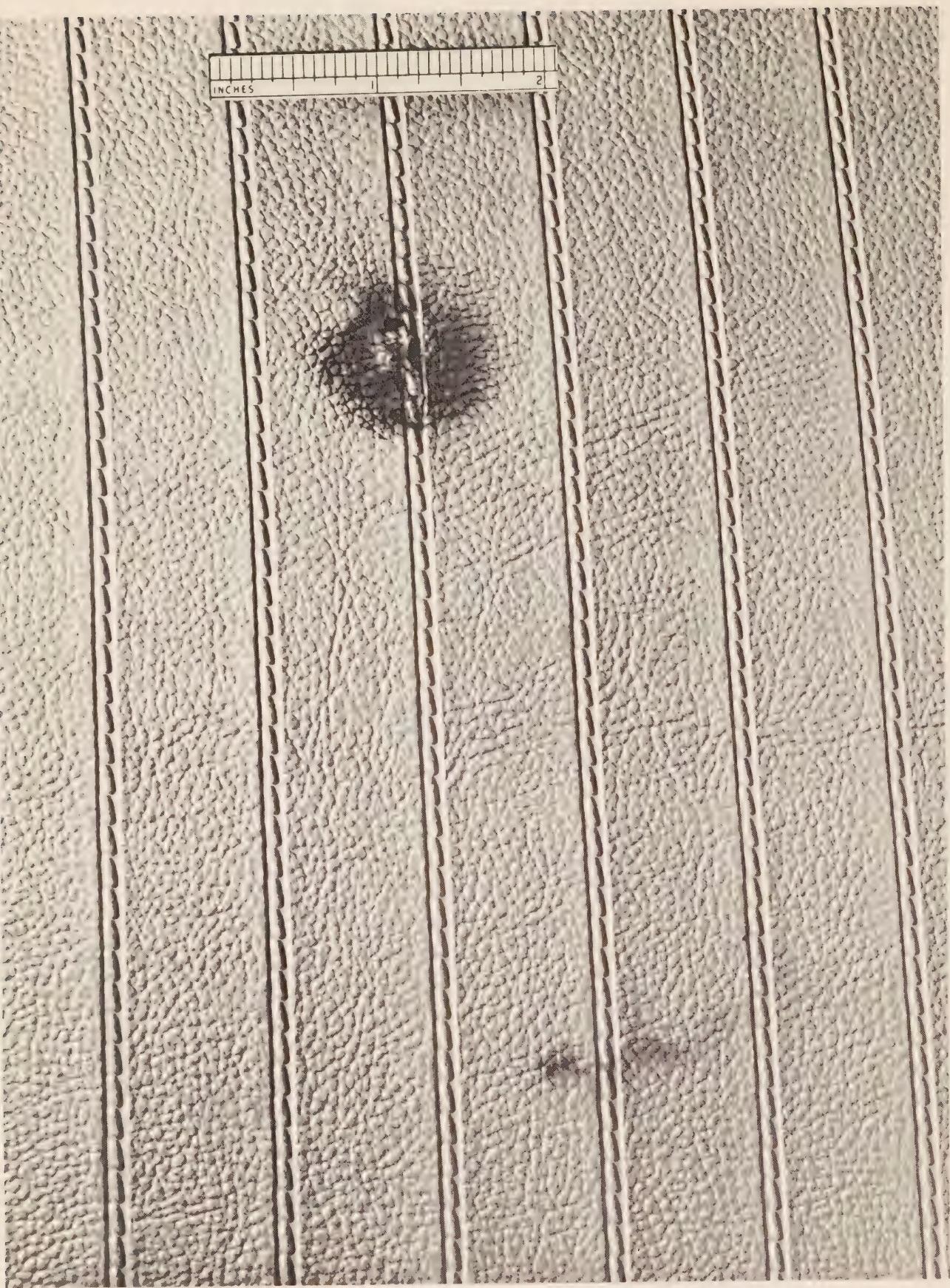


Fig. 11

Fig. 9

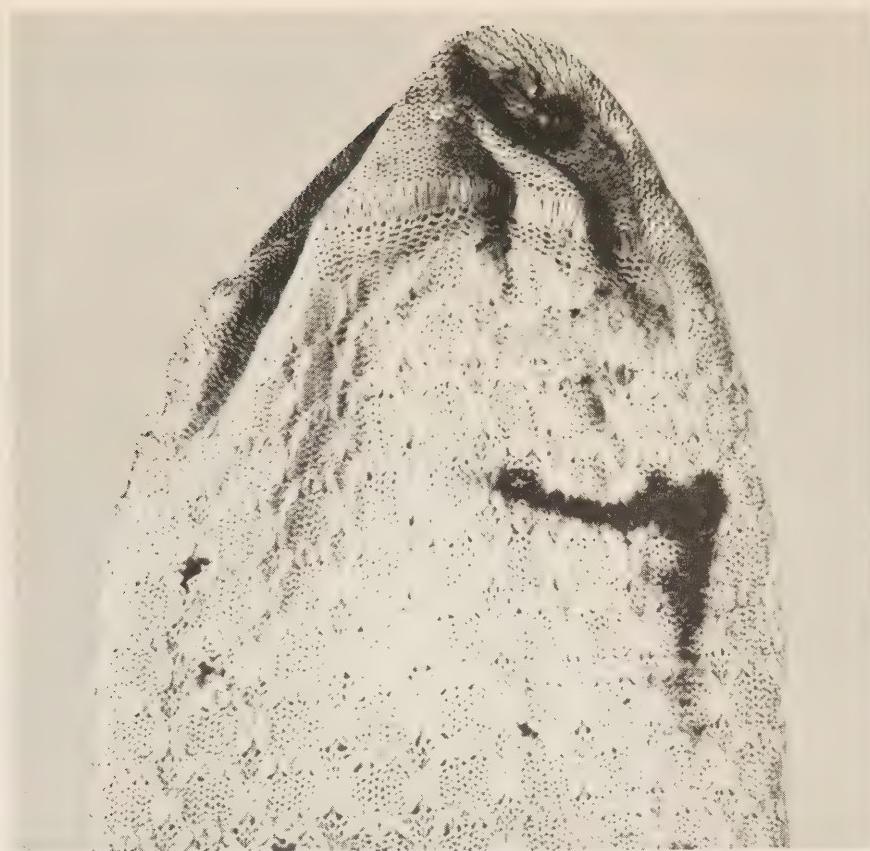


Fig. 10





Fig. 11

On August 25th, 1971 a badly rusted Winchester Model 94, .32 special was found in the trunk of a car and submitted for tests. The cartridge case found in the motel room was identified as having been fired in this rifle. The bullet was too badly damaged for a positive identification to be made.

2. Early in December an automobile with two occupants was stopped by police for a routine check in Toronto. A search of the auto revealed a .22 calibre semi-automatic pistol on the floor of the driver's side. The pistol was checked against two fired cartridge cases recovered at the scene of an armed robbery earlier in the year. These cases were identified as having been fired in the pistol. As a result three persons were charged and convicted of armed robbery.

3. During the summer, as a result of an argument with his neighbor, a man was shot and killed. A search of the house of the accused resulted in the finding of a cheap .22 calibre revolver inside a blue sock. The revolver was loaded, with one cartridge having been fired. The bullet removed from the deceased was identified as having been fired from this revolver.

Just prior to the trial, the question arose as to whether or not the revolver had been inside the sock at the moment of discharge. The revolver, having been entered as an exhibit at the preliminary hearing, was not available for testing. A revolver of the same make, model and with the same physical dimensions as the exhibit revolver was fired inside another blue sock using the same ammunition. Infrared photographs of the test sock (Fig. 9) were compared with infrared photographs of the sock the revolver was found in (Fig. 10). They indicated clearly that the revolver was inside the sock when it was fired as the blackening from the exhaust gases around the cylinder gap could clearly be seen.

4. An automobile was brought to the Centre for examination as it was alleged to have suffered damage from a shot or shots fired at it from a shotgun. The examination revealed damaged areas including a blown-out window and holes in the seats and one door panel. It was however established that these damaged areas were the result of shots being fired from the inside, probably by a revolver, and that the vehicle had not suffered any damage from being shot at by a shotgun. Fig. 11 is an infrared photo of the seat back showing the blackening from the muzzle and the cylinder gap.

PHOTOGRAPHY

Photography conducts examinations of physical matches and seeks similarities that are not visible to the naked eye. The types of objects examined run the entire gamut of physical evidence. Photography can also produce information that is not available by any other means. For example, it may reveal the original writing on altered or defaced documents such as cheques and drivers' licenses. It may reveal bleached laundry marks on clothing and images on black polaroid carbons. It can show foreign inclusions in wood and the inside structure of metals. Stolen cameras and works of art may also be identified. Invisible information on a large spectrum of exhibits can be made visible with ultraviolet and infrared radiation, x-rays and various other special techniques.

The total number of photographs that were made declined from 9,209 in 1970 to 8,364 in 1971, a decrease of 12.7%. Of these, 6,003 were for court submission and 2,361 were for reference and educational purposes. The number of cases examined for outside agencies increased from 15 to 24 and for other sections from 394 to 431.

Research and Development

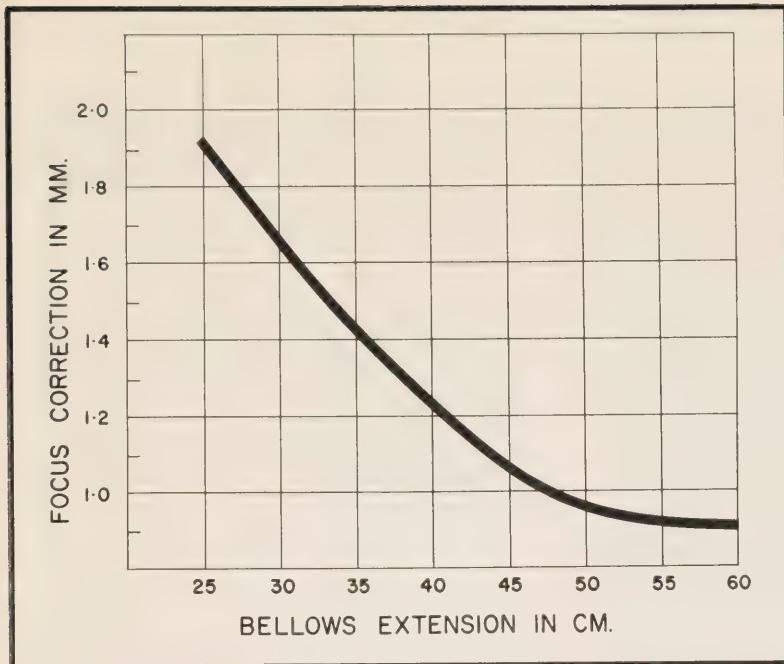
The project on the calibration of various lenses for infrared photography that was started in 1970 was continued this year. We now have four lenses - from 150 mm to 80 mm - that can be used for critical infrared photography. Fig. 12 shows the focus correction for a 12cm Summar macro lens after visual focus has been obtained. On this chart, the bellows extension is plotted against the amount by which the subject has to be moved away from the lens in order to obtain critical infrared focus. This lens would be used on an Aristophot stand with a gelatin 87 filter in front of the lens. This technique was used in case number one below.

Illustrative Cases

1. A number of cheques were stolen from a government agency and altered by an employee. Fig. 13 shows part of one of these as it appeared to the naked eye. An infrared luminescence photograph (Fig. 14) was prepared of the amount figures at a magnification of 10X. This clearly shows that the figure "2" was added with a different ink. The accused pleaded guilty.

2. A man entered a department store in a large city and picked up two pairs of socks. He was seen to rip off the trade labels, drop them to the floor and leave the store without paying. He was followed to his vehicle and stopped by the police. Upon questioning, he denied having been in the sock department,

Fig. 12



of any chartered bank Ontario TORONTO, ONTARIO

AMOUNT
TA ***240.00

ST ST

CLAIM NO.

8069272

date of cheque

MO. DAY YR

10 17 69

date paid up to

MO. DAY YR

10 02 69

CHAIRMAN

VICE-CHAIRMAN

COMMISSIONER

5 KING ST. W. & BAY ST., TORONTO, ONTARIO

see reverse for key to
TYPE OF PAYMENT

Fig. 13

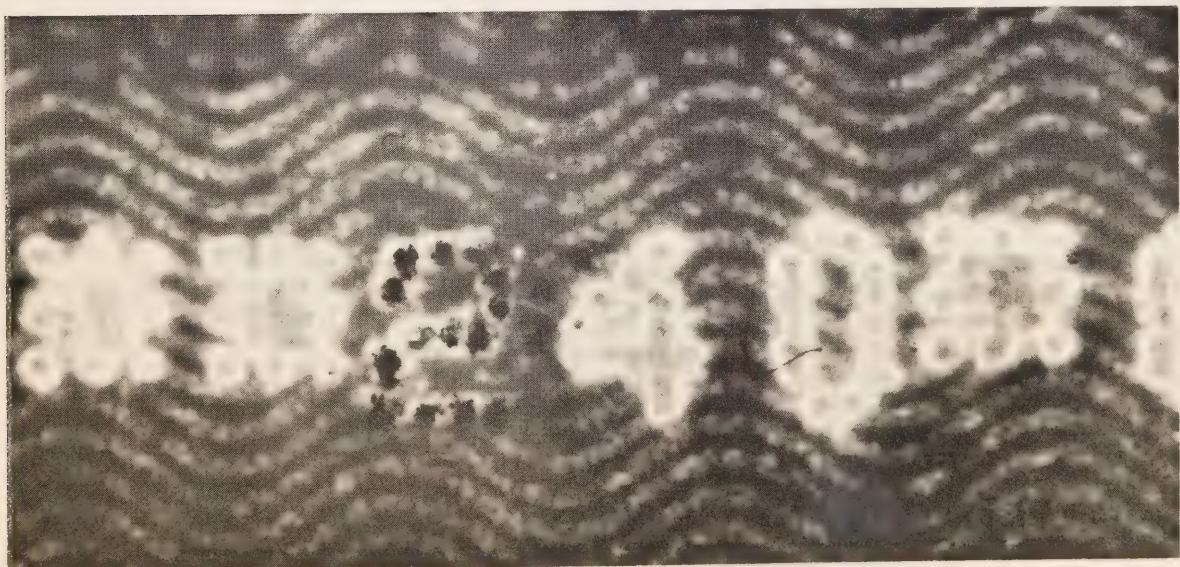


Fig. 14

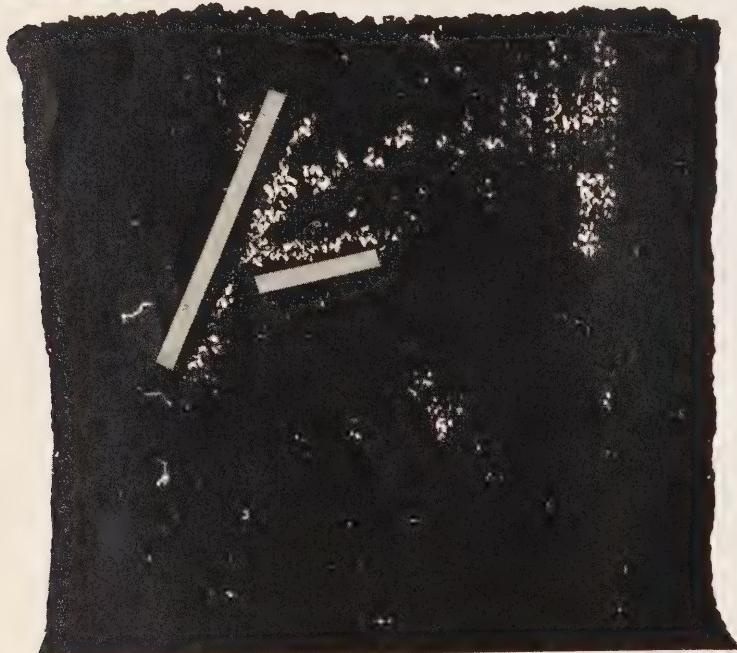


Fig. 15

however a search revealed two pairs of socks in his possession which he claimed he had purchased several days before.

The Centre was asked if the socks could be matched to the labels. Examination with ultraviolet radiation revealed some faint irregular patterns on the socks and on the labels. These patterns were further amplified with filters and high contrast film. The ultraviolet fluorescence photographs (Fig. 15) show the upper leg of two dark socks and the underside of one label. The matching patterns were formed when the labels were removed from the socks and some of the glue from the labels adhered to the socks. Some of the areas that show similar patterns have been outlined. Faced with this evidence, the accused pleaded guilty.

TOXICOLOGY

The Toxicology Section is primarily concerned with examinations for alcohol, other drugs and chemical poisons in biological and other specimens arising from investigations of a medico-legal or criminal nature. In addition, this section is responsible for the administration and functioning of the Breathalyzer programme for the Province of Ontario.

Dr. C. Fabierkiewicz retired at the end of October after nine years of excellent service in the Toxicology Section as a research scientist. Her career started as a medical practitioner in Poland. In Canada, Dr. Fabierkiewicz was employed for many years in the Department of Pharmacology, Faculty of Medicine, University of Toronto in a research capacity, and when she joined the staff of the Toxicology Section in 1962, she brought with her a wealth of experience and knowledge in the field of drug detection. Her specialties were crystallography and colour-reactions as applied to the detection of drugs, particularly the phenothiazine derivatives, and the results of her work appeared in many scientific publications.

The vacancy resulting from Dr. Fabierkiewicz's retirement was filled in November by Mr. John P. Kertesz who obtained his Master's Degree from McGill University, Department of Experimental Medicine. Prior to his post-graduate studies, Mr. Kertesz was employed for four years in the Racing Chemistry Section of the Department of Health.

Our technical staff was increased in October when Mrs. E. Koves joined the section. Mrs. Koves has an Industrial Technician's diploma from the Technical Collegiate Institute of Chemistry in Budapest, Hungary, and has brought with her fifteen years of experience in pharmaceutical and chemical research. Prior to joining the Centre, Mrs. Koves was employed for five years in the Department of Pharmacology, Faculty of Medicine, University of Toronto.

There were 3,341 cases completed during 1971, an increase of 264 (8.6%) over the previous year. This increase was largely in the category of the anatomically unexplained deaths, which is the most time-consuming and complex type of case. The number of court appearances also increased from 132 to 145.

The complexity of toxicological examinations has been further enhanced by the rising incidence of the newer type of chemical substances being used and abused. One instance of fatal methylenedioxymethamphetamine (MDA) poisoning was described in last year's annual report. Since then, the results of toxicological studies revealed five additional MDA deaths of younger people in Ontario. Our concern over the number of MDA deaths prompted a

warning to the general public through the news media in order to bring the potential hazards of this illegal drug to the attention of the users. Another substance which has been encountered singly or in combination with other drugs more frequently this year than in previous years is propoxyphene. This drug is prescribed by physicians to alleviate pain and a study of its forensic toxicological aspects is now in progress.

The administration of the Breathalyzer programme has again this year fully occupied Messrs. Hallett and Ghani and also required part-time assistance from Mr. Hall and Mrs. Charlebois. A detailed report on this programme is given in Appendix B.

Research and Development

The research project aimed at the development of a method to determine the presence of certain of the constituents of marijuana in body specimens of users is still in progress. The reactions of these with a number of halogenating reagents have been investigated. The most useful reagents were found to be N-chloro and N-bromo succinimide which react with the cannabinoids to form monochloro and monobromo derivatives. The heptafluorobutyryl esters of these derivatives were found to be detectable in sub-nanogram quantities by electron-capture gas chromatography. The second phase of this difficult project now under investigation is concerned with the extraction behaviour of these cannabinol derivatives from blood and urine.

A project was undertaken to evaluate gas chromatography for screening some central nervous system acting drugs in blood at therapeutic levels. The results of preliminary work look very promising. This project will be continued to study the feasibility of using temperature programming, to determine extraction recoveries of the drugs of concern and to gather data on chromatograms of extracts of blank (drug-free) bloods. This type of screening when fully developed could increase the efficiency of toxicological services considerably.

A number of shorter projects were started in order to evaluate, further develop and standardize our analytical procedures for drugs such as methylenedioxymethamphetamine (MDA), methyprylone ("Noludar"), methadone and propoxyphene ("Darvon"). As many of the available toxicological procedures have not been adequately standardized and evaluated, projects of this sort constitute important long-term developmental work in the section.

Publications

1. "Methylenedioxymethamphetamine (MDA): Analytical and Forensic Aspects of Fatal Poisoning." G. Cimbura. Accepted for publication in the Journal of Forensic Sciences.

2. "Suspected Homicidal Poisoning with Strychnine." C. Corley. Submitted for publication in the Bulletin of the International Association of Forensic Sciences.
3. "Marijuana - Preparation and Structural Characterization of some Halogenated Cannabinols and their Detectability by Electron Capture Gas Chromatography." J. Wells. Submitted for publication.

Illustrative Cases

1. A middle-aged woman was found by her husband lying dead on the front seat of her car parked near their summer cottage. The doors and windows of the car were closed, the gas tank was almost full and the ignition was off. The car and particularly the exhaust system appeared in excellent mechanical condition and there were no indications of carbon monoxide exposure. Police investigation of the victim's background revealed a history of depression, a previous interrupted attempt at suicide by carbon monoxide poisoning in her car, and frequent discord in her married life. At autopsy, early signs of decomposition were noted but a cause of death could not be established. Blood and other body tissues were submitted for toxicological studies.

Since there were some suspicious circumstances, the case was assigned priority in an attempt to provide leads to the investigators. Within hours, the toxicologist found a lethal level of carbon monoxide in the blood of the victim. However, in view of the apparently perfect condition of the car, the source of the carbon monoxide was a mystery and the circumstances were strongly suggestive of the involvement of a second party. In order to examine the car the toxicologist travelled to the scene of the death. The results of his tests confirmed the original belief that the car could not have been the source of the poisonous gas unless the exhaust fumes had been purposely introduced into the vehicle. A detailed search of the cottage disclosed pieces of adhesive tape in the wood stove, some stained rags, and two vacuum-cleaner hoses in their usual storage cupboard. These, together with the end of the car tail-pipe, were brought to the Centre for further examination. Traces of an adhesive material were found on the end of one of the hoses (Fig. 16). These were chemically similar to the adhesive found on the car tail-pipe (Fig. 17), and on the tape from the oven. This evidence suggested that exhaust gas had been led into the car through the vacuum cleaner hoses and the possibility of homicide or suicide in which the evidence had been subsequently tampered with had to be seriously considered. Following a very thorough interrogation of all the people involved, the police were satisfied that this was not a homicide and that no other party was involved in hiding the hoses and tape.

The only remaining theory which could fit all the circumstances was a well planned suicide in which the victim



Fig. 16



Fig. 17

connected the hose, started the engine, allowed the car to fill with gas, removed and put away the hose, tape and rags, entered the gas filled car, turned off the engine, stretched out on the front seat and eventually died of carbon monoxide poisoning. Since it was necessary to prove that this theory was technically possible, the toxicologist simulated the chain of events suggested, and at the end of the experiment, measured the concentration of carbon monoxide inside the car. It was found to be still sufficiently high to cause death. The findings were presented at the Coroner's Inquest and the verdict of the jury was suicide by carbon monoxide poisoning.

2. A middle-aged woman became ill while riding to work on a bus early in the morning. Admitted to hospital, she was very apprehensive, went into convulsions and died suddenly about two hours after her symptoms first appeared. Her purse contained two different types of amphetamine capsules and tablets of a diuretic drug. This medication had been prescribed for her for the treatment of obesity.

An autopsy failed to reveal the cause of death. The possibility that death occurred as the result of an unusual reaction to her medication was being considered. Blood, urine and a very small amount of stomach content were submitted for toxicological examination which, in addition to traces of the medication, also revealed the presence of strychnine. Since accidental or suicidal poisoning did not appear likely in this case, the finding of strychnine initiated an extensive police investigation. The body of the victim was exhumed in order to provide the toxicologist with additional specimens to determine the amount of strychnine in the body. Further examination of the exhumed liver tissue revealed a quantity of strychnine consistent with a lethal dose.

Although the circumstances of this case were strongly suggestive of homicide, the police were unable to obtain sufficient evidence to lay criminal charges. The victim's husband committed suicide before he was to testify at the Coroner's Inquest. The jury brought in a verdict of death by culpable homicide. One of its recommendations was that all drug capsules be sealed after filling, since it had been speculated that one of the victim's amphetamine capsules had been emptied and refilled with a lethal dose of strychnine.

3. A car observed travelling in a bizarre manner was stopped by a police officer. The driver exhibited all the usual signs of alcohol intoxication and was charged with driving while his ability was impaired by alcohol or drugs. Breathalyzer readings were negative for alcohol so the police officer obtained samples of blood and urine which were submitted for toxicological examination.

Analysis of the blood revealed pentobarbital in a concentration above the usual therapeutic range and diazepam, a tranquilizing drug. In the urine sample, in addition to pentobarbital, the toxicologist found oxazepam, a metabolic product of diazepam. The toxicologist was able to give an opinion that the findings could adversely affect a person's ability to drive safely. The court found the driver guilty.

Because of the increased use of drugs in our society, cases of this type are becoming more common.

IN MEMORIAM



PROF. L. JOSLYN ROGERS

Prof. L. Joslyn Rogers passed away on March 22, 1971 at his winter home in Lakeland, Florida after a brief illness. One of the best known forensic scientists in Canada, Prof. Rogers retired from the Centre of Forensic Sciences in 1967 following a career spanning 56 years in analytical chemistry and forensic science.

Born on a farm at Oshawa, Ontario on February 18, 1887, Prof. Rogers attended Mary Street Public School and Oshawa High School before going on to the School of Practical Science in Toronto in 1905. His major interest there was chemistry, an interest inspired in him by his high school science teacher and his own natural and ever present curiosity about life and matter. Throughout his life he regarded the processes of chemistry as a form of magic to be viewed with a combination of curiosity, reason and awe.

Rogers received his B.A.Sc. with Honours in 1908 and his M.A. in 1912. His Master's thesis was "A Method for the Analysis of Chloral Hydrate in Tissue." This work on the classical "Mickey Finn" of murder mysteries presaged the work that was to occupy most of his professional life. He was appointed Professor of Analytical Chemistry in the University of Toronto in 1918 and held that appointment until 1954.

In 1911, Rogers was assistant to Prof. Wm. Hodgson Ellis who performed most of the analyses for the police and coroners at that time. Not feeling well one summer's day when a police officer arrived in his laboratory from Parry Sound, Ellis asked Rogers if he thought he could take the case. Eagerly, Rogers replied that he certainly could, only to shortly regret his decision when he learned that the sample was the stomach contents of a man who had been killed by some falling logs the previous fall.

By 1912, Prof. Rogers had taken over most of the forensic work from Prof. Ellis and was ready for his first murder case. This was from Hamilton where a man had been somewhat chagrined to learn that the woman he had just married, already had two children without benefit of wedlock and required hospital treatment

for a social disease. He sent her a box of candies which she did not eat herself but gave to one of her visitors in the hospital. The visitor died suddenly and Prof. Rogers recovered about one grain of strychnine from her stomach. The unhappy bridegroom was tried for her murder and, although a sympathetic jury acquitted him, he died within a year of diphtheria.

Joslyn Rogers always remembered the severe cross-examination he underwent in that case because he had not done any physiological tests on the stomach extract. As a result, one of the major principles influencing all of his work and one which he passed on to all his students was "Don't theorize; experiment! The strongest answer you can give in the witness box is 'I know it is so because I have done it'!" This even extended to work with explosives where "the best test for nitroglycerine is, see if it will explode!"

Over the succeeding half century, Prof. Rogers taught thousands of students in the University virtually all of whom remembered him fondly for his humanity as well as for his ability to transmit knowledge. He developed many analytical techniques, some of which are still used in the forensic laboratory today, and he was associated with the investigation of most of the famous criminal cases in Ontario. Blessed with an uncanny ability to remember people, places and dates, he could for example give an interviewer in 1969 the details of the "Ravine Murder" case in Toronto in 1935. "It happened the night of the fourth-fifth of November 1935 in Toronto. Mr. O..... had a day old child in hospital with his wife. He went to see them and after he left he had a few beers in a hotel. Crossing a bridge over the ravine in the east end, he assaulted a little girl and knocked her over the edge killing her. The girl was wearing a jacket that was 27% rabbit hair and 73% angora wool. After Mr. O..... was arrested the next day, I picked 298 hairs from his clothing. Two of these were strays but the remainder was identified and found to be 27% rabbit hair and 73% angora. We were even able to show they had the same dye as the girl's jacket." He was then able to go on and give the details of the trial, its dates, principle participants and outcome.

During his "second career" after reaching the age of 67 and "retiring" from the University, Joslyn Rogers' tremendous energy, enthusiasm, knowledge and wisdom provided an inspirational example to his much younger associates in the Centre of Forensic Sciences. His wise counsel and guidance played no small role in raising the organization to its present stature. All who had the privilege to be closely associated with him are bigger men as a result.

Prof. Rogers married the former Dorothea Whiton on May 6, 1913. Mrs. Rogers predeceased him and they are survived by one son, Dr. Joslyn W. of Toronto.

APPENDIX A.

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PHOTOGRAPHY

Mr. U. von Bremen
Mr. G. Brown

Mr. L. K. Blunt

APPENDIX B.

BREATHALYZER PROGRAMME 1971.

Four training courses were conducted at the Ontario Provincial Police College during 1971. Of the 144 officers who attended, 124 successfully completed their training and were designated as "Qualified Technicians" by the Minister of Justice and Attorney General for Ontario. This brought the number designated to date to 748.

Breathalyzers were put into service at the Alliston, Dutton, Espanola, Geraldton and Killaloe detachments of the Ontario Provincial Police, at the St. Catharines division of the Niagara Regional Police Force and at the Gloucester Township Police Department. As of December 31st there were 121 Breathalyzers in service, 68 of which were located at Ontario Provincial Police detachments and 53 at 43 Municipal Police Departments.

In February a Breathalyzer operator evaluation and instrument inspection programme was initiated. The programme consisted of:

- a) A field inspection of all Breathalyzers to ensure that they had been maintained in a satisfactory condition.
- b) A review of the operational procedures employed in the local breath testing programmes.
- c) An evaluation through written and practical examinations of all Breathalyzer Operators who had been designated as "Qualified Technicians" and who were listed as actively engaged in the breath testing programme.

The Field Co-ordinator tested 585 operators, made 77 visits to Provincial Police detachments and 62 visits to Municipal Police Departments. He travelled approximately 5,500 miles by air and 14,500 miles by automobile.

There was a normal increase in the use of the Breathalyzer during 1971 considering the increased number of Breathalyzers and trained operators available. Breathalyzer operators interviewed 34,719 drivers in 1971 as compared with 29,716 in the previous year. These resulted in an increase of 3,723 tests conducted - from 27,141 to 30,864. The number of drivers who refused to provide a breath sample for alcohol analysis was 3,855. This was an increase in refusals to 11.1% of those interviewed from 8.7% in 1970. The number of drivers who, because of a low blood alcohol level, were not charged with either impaired driving or having a blood alcohol level in excess of 80 milligrams per 100 millilitres was 2,993.

The number of breath tests conducted in connection with the Liquor Control Act or Criminal Code cases not involving driving offences decreased from 988 in the previous year to 606 in 1971. The decrease was due to the change in the Liquor Control Act reducing the legal age for consumption of alcoholic beverages. The number of tests conducted for other Criminal Code offences increased from 103 to 126 in 1971.

ONTARIO PROVINCIAL POLICE

Location	Inter- views	Refusals	Tests	Tested		Charged or 236 C.C.C.
				No Charge Low Result	234	
Alliston **	31	12	19	0	19	
Bancroft	84	8	76	9	67	
Barrie	581	83	498	15	483	
Belleville	193	22	171	14	157	
Blind River	184	8	176	12	164	
Bracebridge	235	20	215	23	192	
Brantford	54	3	51	3	48	
Brechin	95	9	86	6	80	
Brighton *	78	10	68	2	66	
Brockville	142	10	132	4	128	
Burk's Falls	86	0	86	7	79	
Burlington	171	24	147	8	139	
Cayuga	123	16	107	6	101	
Chapleau	64	4	60	2	58	
Chatham	348	21	327	8	319	
Cobourg	204	23	181	4	177	
Downsview	126	18	108	7	101	
Dryden	179	8	171	14	157	
Dutton **	27	4	23	0	23	
Elliot Lake *	19	1	18	2	16	
Emo	62	3	59	6	53	
Espanola **	21	3	18	1	17	
Essex	241	12	229	9	220	
Fort Erie	148	8	140	4	136	
Geraldton **	24	0	24	1	23	
Godерich	197	20	177	11	166	
Guelph*	90	9	81	3	78	
Haileybury	129	5	124	28	96	
Hawkesbury	105	9	96	7	89	
Hearst	118	1	117	11	106	
Kapuskasing*	76	6	70	6	64	
Killaloe **	38	3	35	2	33	
Kingston	205	12	193	12	181	
Kenora	113	12	101	3	98	
Kirkland Lake	113	4	109	9	100	
Kitchener*	159	12	147	11	136	
Lancaster	84	8	76	5	71	
Lindsay	238	10	228	6	222	
Little Current	191	7	184	7	177	
London	188	16	172	3	169	
Long Sault	161	13	148	11	137	
Madoc	99	13	86	4	82	
Midland	151	15	136	5	131	
Milton	189	25	164	21	143	
Mount Forest	329	12	317	17	300	
Napanee	162	8	154	6	148	
Newcastle	157	16	141	19	122	
Niagara Falls	148	12	136	21	115	
Nipigon	66	7	59	8	51	
North Bay	186	9	177	13	164	

ONTARIO PROVINCIAL POLICE

Location	Inter- views	Refusals	Tests	Tested		
				No Charge Low Result	Charged or 236 C.C.C.	234
Oakville *	128	17	111	6		105
Oak Ridges	264	17	247	19		228
Orillia*	49	3	46	3		43
Ottawa	399	25	374	65		309
Owen Sound	524	23	501	59		442
Parry Sound	153	10	143	14		129
Pembroke	273	12	261	14		247
Perth	136	10	126	6		120
Peterborough	167	7	160	7		153
Petrolia	175	16	159	5		154
Port Credit	186	24	162	8		154
Rockland	151	14	137	15		122
St. Catharines	201	16	185	20		165
St. Thomas	216	22	194	16		178
Sault Ste. Marie	107	6	101	3		98
Sebringville *	87	14	73	3		70
Simcoe	239	29	210	2		208
Snelgrove	136	15	121	10		111
South Porcupine	322	13	309	29		280
Sudbury	542	14	528	6		522
Thunder Bay	153	11	142	4		138
Tillsonburg	137	10	127	4		123
Waterdown	167	24	143	9		134
Wawa	54	3	51	2		49
Welland *	13	0	13	0		13
Whitby	413	32	381	40		341
Woodstock	159	9	150	18		132
Total -	12,763	990	11,773	803		10,970

* Breathalyzer not located at that Detachment.

** Breathalyzer in service part year only.

MUNICIPAL POLICE DEPARTMENTS

Location	Inter- views	Refusals	Tests	Tested			Charged or 236 C.C.C.
				No Low	Charge Result	234	
Ancaster Twp. *	19	1	18		1		17
Belleville	205	29	176		13		163
Brampton	324	30	294		49		245
Brantford	225	24	201		11		190
Brockville	270	14	256		27		229
Burlington *	200	10	190		16		174
Chatham	170	7	163		3		160
Chinguacousy Twp.	127	6	121		2		119
Cornwall	187	17	170		3		167
Delhi *	22	3	19		0		19
Dryden *	25	1	24		0		24
Dundas	78	8	70		4		66
Elliot Lake Twp.	38	2	36		5		31
Fort Frances	87	2	85		5		80
Galt	151	19	132		17		115
Georgetown	74	18	56		4		52
Gloucester Twp. **	94	11	83		6		77
Guelph	240	23	217		6		211
Hamilton	821	220	601		28		573
Kapuskasing	52	8	44		4		40
Kingston	209	9	200		7		193
Kirkland Lake *	16	0	16		1		15
Kitchener	498	45	453		22		431
Lindsay *	101	5	96		4		92
London	840	134	706		50		656
Metro Toronto	10,078	1,612	8,466		1,391		7,075
Mississauga	412	80	332		51		281
Nepean Twp. *	95	7	88		12		76
Niagara Regional	1,005	92	913		89		824
North Bay	267	22	245		14		231
Oakville	190	16	174		19		155
Orillia	159	8	151		8		143
Oshawa	569	35	534		28		506
Ottawa	660	78	582		53		529
Pembroke *	124	8	116		13		103
Peterborough	124	8	116		2		114
Pickering Twp.	249	11	238		52		186
Port Credit*	51	6	45		0		45
Preston *	50	4	46		3		43
St. Thomas	71	5	66		5		61
Saltfleet Twp.	75	10	65		1		64
Sarnia	295	19	276		13		263
Sault Ste. Marie	288	13	275		16		259
Smiths Falls	94	7	87		8		79
Stratford	115	12	103		5		98
Sudbury	486	42	444		43		401
Thunder Bay	320	24	296		21		275

MUNICIPAL POLICE DEPARTMENTS

Location	Inter- views	Refusals	Tests	Tested		Charged or 236 C.C.C.	234
				No Low Result	Charge		
Tillsonburg	47	2	45	2		43	
Timmins	77	11	66	7		59	
Trenton	107	8	99	6		93	
Vanier *	47	6	41	7		34	
Waterloo	200	20	180	19		161	
Windsor	481	45	436	11		425	
Woodstock	41	3	38	0		38	
York Regional	106	5	101	3		98	
Total -	21,956	2,865	19,091	2,190		16,901	

* Breathalyzer not located at that Department.

** Breathalyzer in service part year only.

BREATHALYZER

ONTARIO PROVINCIAL POLICE - MUNICIPAL POLICE

Total For Year	Interviews	Refusals	Tests	No Charge Low Result	Charged or 236 C.C.C.	Tested Non-Driving Offence
1971	34,719	3,855 11.1%	30,864	2,993 9.7% of Tests	27,871	606
1970	29,716	2,575 8.7%	27,141	2,261 8.4% of Tests	24,880	988
1969	18,042	3,067 17%	14,963	1,111 7.4% of Tests	12,968	954
1968	16,100	3,629 22.5%	12,429	811 6.5% of Tests	10,902	752
1967	13,376	3,548 26.5%	9,707	763 7.9% of Tests	8,533	623

The interviews for 1971 and 1970 are for driving offences only and do not include those tested for the non-driving offences as in the previous years.

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